Environmental Resources, LLC
P.O. Box 5305, Bozeman, Montana 59717 Phone (406) 582-8491 email: ruwaller@gmail.com

January 8, 2020

Mr. Richard Seiler
Valley County Road Department
P.O. Box 1024
Glasgow, MT 59230

Subject: Corrective Action Work Plan
Valley County Road Shop, Glasgow, Montana
DEQ Facility ID No. 53-02065
DEQ Release No. 3496, Work Plan ID 33986

Dear Mr. Seiler:

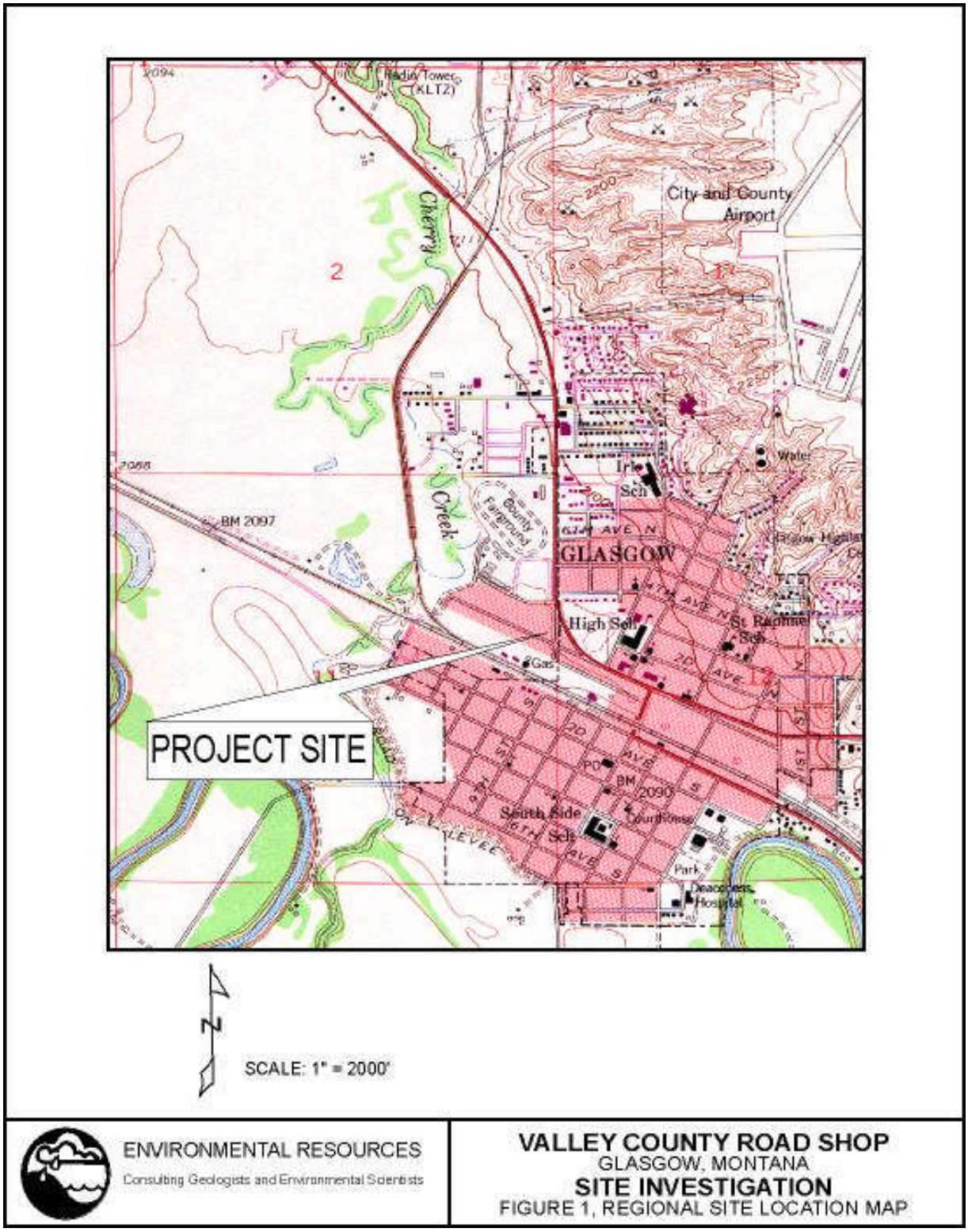
Environmental Resources, LLC is pleased to submit this Corrective Action Work Plan to outline activities associated with additional investigation and monitoring of subsurface petroleum contamination at the above referenced petroleum release site. Submittal of this work plan was requested by the Montana Department of Environmental Quality (DEQ) to further define the extent and magnitude of petroleum contaminated soil and groundwater beneath the release site.

Site Location

The Valley County Road Shop project site is situated in the southeast quarter of the northeast quarter of Section 11, Township 28 North, Range 39 East, Montana Principal Meridian as shown on Figure 1. The project site is situated within the city limits of Glasgow, MT along U.S. Highway 2.

Site Geology/Hydrogeology

Soils at the project site consist of fine-grained fluvial sediments associated with the Milk River, which is situated approximately one mile south of the project site. Local bedrock consists of the Cretaceous Bearpaw Shale. Groundwater is first encountered at approximately seven feet below ground surface. Highly plastic, dense silty clay and sandy clay interbedded with fine- to coarse-grained sand intervals is encountered from 0-15 feet below ground surface. The local groundwater flow direction measured at the project site is to the southeast and southwest toward the Milk River.


Radio Tower (KLTZ)
Cherry Creek
City and County Airport
BM 2097
GLASGOW
High Sch
St. Pauline Sch
South Side Sch
BM 2090
Courthouse
Park
Deaconess Hospital
Water
Gas
PROJECT SITE
N
SCALE: 1" = 2000'
ENVIRONMENTAL RESOURCES
Consulting Geologists and Environmental Scientists
VALLEY COUNTY ROAD SHOP
GLASGOW, MONTANA
SITE INVESTIGATION
FIGURE 1, REGIONAL SITE LOCATION MAP

Scope of Work

Proposed tasks to be performed within the scope of this work plan include the following:

1) Install three groundwater monitoring wells, one northeast of MW-5 but on the south side of the sewer line, one northwest of MW-5 and on north of MW-5 between the onsite building and northern edge of the sewer line.
2) Monitor and sample all site monitoring wells during August 2020 and August 2021.
3) Analyze all groundwater samples in accordance with Montana Tier 1 Risk-Based Corrective Action Guidance for Petroleum Releases. Also analyze samples for Intrinsic Biodegradation Indicators (IBIs).
4) Validate all laboratory data.
5) Prepare an updated Release Closure Plan (RCP).
6) Prepare a Standardized Soil Boring and Monitor Well Installation Report (AR-03).

Soil Boring/Monitoring Well Installation

Up to three additional groundwater monitoring wells will be installed as shown on Figure 2. The soil borings and monitoring wells will be installed using a hollow-stem auger drilling rig. Groundwater monitoring wells will be completed at 14 feet below ground surface with 10 feet of 0.020-inch slotted flush-threaded Schedule 40 PVC well screen and 4 feet of blank PVC well casing. The annulus around the well screen will be filled with 10-20 mesh Colorado silica to within one foot above the well screen and the remaining annulus will be filled with 3/8-inch bentonite chips to within one foot of ground surface.

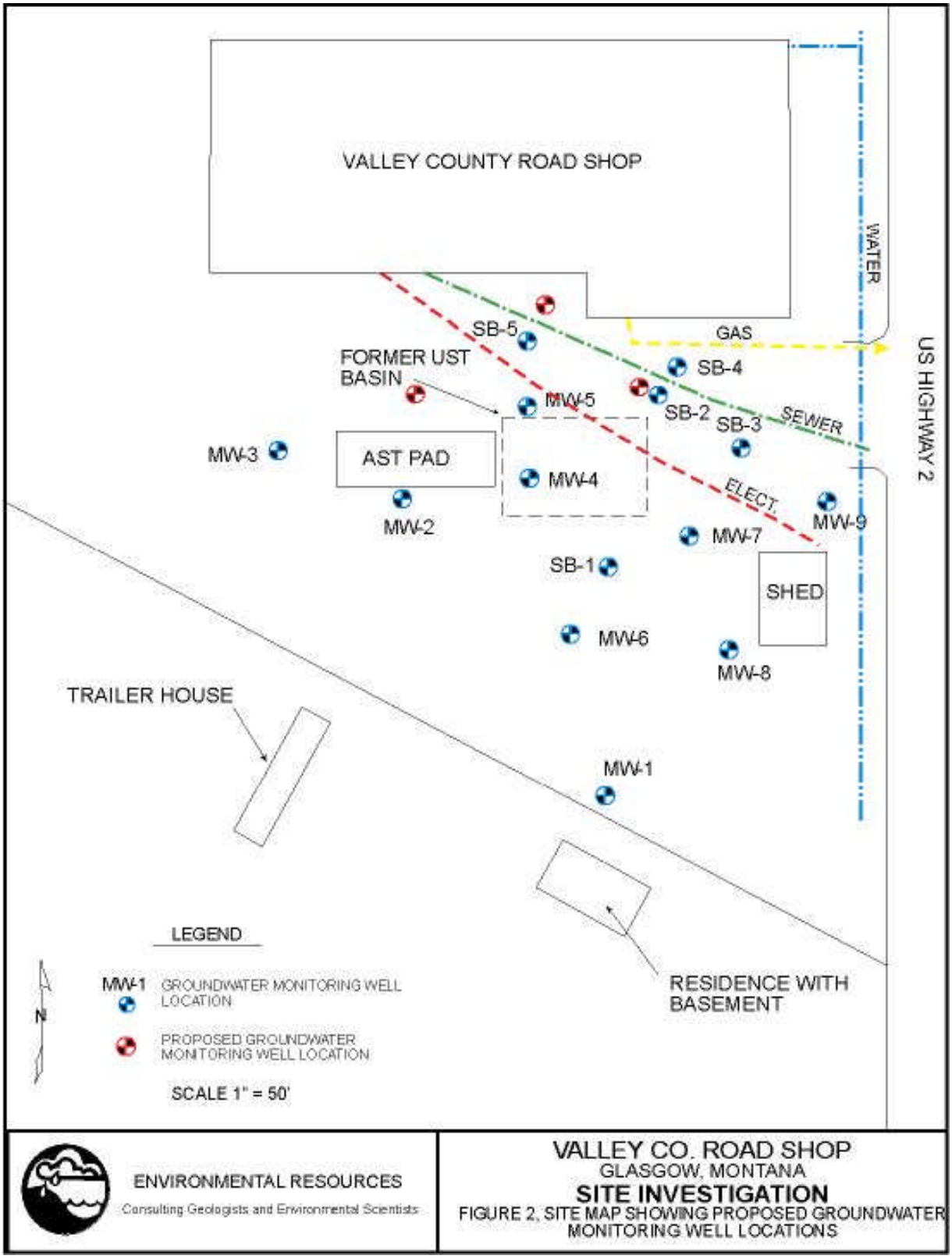
Well Development/Surveying

The newly installed monitoring wells will be developed for a minimum of one hour using a submersible pump until at least ten well volumes of groundwater are removed and no further improvements in water clarity are noted. Static water levels will be measured in all of the monitoring wells following a 24 hour equilibration period after development. Water level measurements will be obtained using a Keck ET-89 electronic water level indicator.

All newly installed and existing monitoring wells will be surveyed for elevation within $\pm$ 0.01 feet by a Montana Registered Land Surveyor and referenced to a local USGS benchmark.

Material Sampling

Drill cores will be logged for lithology, texture, color, moisture and volatile petroleum content. All soil samples will be visually classified for texture using the Unified Soil Classification System (USCS) according to ASTM-D-2488. Soil samples from two foot intervals and from obvious areas of petroleum discoloration will be analyzed for volatile petroleum hydrocarbons using a Photovac Microtip photo ionization detector (PID) with a standard heated jar headspace method.


VALLEY COUNTY ROAD SHOP
WATER
US HIGHWAY 2
SB-5
GAS
FORMER UST BASIN
SB-4
MW-5
SB-2
SB-3
SEWER
MW-3
AST PAD
MW-4
ELECT.
MW-2
MW-9
MW-7
SB-1
SHED
MW-6
MW-8
TRAILER HOUSE
MW-1
RESIDENCE WITH BASEMENT
LEGEND
MW-1 GROUNDWATER MONITORING WELL LOCATION
PROPOSED GROUNDWATER MONITORING WELL LOCATION
N
SCALE 1" = 50'
ENVIRONMENTAL RESOURCES
Consulting Geologists and Environmental Scientists
VALLEY CO. ROAD SHOP
GLASGOW, MONTANA
SITE INVESTIGATION
FIGURE 2, SITE MAP SHOWING PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

One soil sample corresponding to the interval that exhibits the highest headspace reading and/or one sample from the air-water interface will be analyzed for VPH at Alpine Analytical in Helena, Montana.

Groundwater Sample Collection and Analysis

Groundwater samples will be collected from monitoring wells MW-1-12 during August 2020 and again during August 2021. Groundwater elevations will be measured in all of the site monitoring wells prior to purging and sample collection.

All of the well covers will be opened and the locking caps removed at least 30 minutes prior to obtaining water level measurements. Static water levels will be measured from a reference point on top of the north side of each well casing using a Keck ET-89 electronic water levels indicator. The water level indicator will be decontaminated prior to each measurement. Decontamination will be accomplished by scrubbing the indicator tip in an *Alconox®* wash solution, rinsing with a 10% methanol solution and triple rinsing with distilled water.

Following measurement of the static water levels, sample collection will commence by purging each well using a low flow sampling pump. Indicator parameters ORP, pH, specific conductance and temperature will be measured during sample purging. Samples will be collected when the measured indicator parameters stabilize, indicating that stagnant water has been removed from the well bore.

Samples will be decanted into appropriate sample jars, preserved and placed on ice while awaiting delivery to the analytical laboratory. Groundwater samples will be analyzed for VPH using the Massachusetts Method and for IBIs.

Report and RCP Preparation

An updated RCP will be prepared to outline a process to achieve release closure. The results of the RCP preparation will be included in a Standardized Soil Boring and Monitoring Well Installation Report (AR-03). The report will summarize the results of work conducted within the scope of this work plan and will provide recommendations for future corrective action that may be required.

Investigative Methods

Methods practiced during this investigation will follow generally accepted practices of similar consulting firms in the same geographical area. Quality Assurance/ Quality Control methods will be employed throughout all phases of this investigation to ensure meaningful and reproducible results and data.

Investigation Derived Waste

Drill cuttings, excess sample materials, drilling fluids, and water removed from a well during installation, development, and aquifer testing and all other investigation derived wastes will be disposed of according to all applicable local, state and federal laws and regulations governing the disposition of investigation derived wastes. Investigation derived wastes may consist of the following materials:

-- Drill cuttings
-- Purge water from monitor well sampling
-- Used soil and groundwater sampling materials
-- Excess sample material (soil and water)

Health and Safety

Health and safety issues will be addressed throughout this investigation to prevent exposure of site workers and other onsite personnel to potentially hazardous situations and chemical compounds. Site specific health and safety precautions and information will be contained in a Health and Safety Plan which will remain onsite during all field activities.

Project Costs

Costs associated with groundwater monitoring are outlined on the attached Unit Cost Worksheet. Costs associated with the additional subsurface investigation are summarized below.

COST ESTIMATE--REMEDIAL INVESTIGATION, VALLEY CO. ROAD SHOP, GLASGOW, MT

Task 1-Well Installation

Project management	3.0 hrs @ $134/hr	$402.00
Work plan prep	AC-03	965.00
Onsite supervision, Scientist II	14.0 hrs @ $118.50/hr	1659.00
PID rental	2 days @ $90/day	180.00
Mobilization, RT from Bozeman	13.0 hrs @ $118.50/hr	1540.50
Mileage, 4WD field truck	720 miles @ $0.63/mile	453.60
Per Diem	4 days @ $30.50/day	122.00
Lodging	2 nights @ $120/night	240.00
Surveying	estimated	1200.00
Drilling services	Boland Drilling bid	5271.00

Task 2-Reporting

AR-03 Report preparation		$2525.00
Additional reporting for additional groundwater monitoring event	8.0 hrs @ $134.50/hr	1076.00
RCP update	3.0 hrs @ $134.50/hr	403.50

TOTAL ESTIMATED COST **$16,037.60**

Limitations

This work was performed in accordance with generally accepted practices of other consulting firms conducting similar studies. Environmental Resources, LLC observed that degree of care and skill generally exercised by other consultants under similar conditions. Our findings and conclusions must not be considered as scientific certainties, but as opinions based upon our professional judgment based upon the data gathered during the course of this investigation. Other than this, no warranty is implied or intended.

Submitted by
Environmental Resources, LLC

Robert H. Waller, Principal Geologist

cc: DEQ-PTCS
PTRCB

Attachments: Unit Cost Worksheet, Drill Bids

GROUNDWATER MONITORING AND SAMPLING

UNIT COST WORKSHEET

Montana Department of Environmental Quality
Petroleum Release Section/Petroleum Fund Services Section

Contractor Information

Company Name: Environmental Resources, LLC

Address: P.O. Box 5305

City, State, Zip: Bozeman, MT 59717

Phone:406.582.8491

Cost Estimator: Bob Waller

Project Information

Site Name: Valley County Road Shop _____ Facility ID # 53-02065

Address: Highway 2 West _____ Release # 3496

City: Glasgow

Monitoring Well Details

Total Number of Wells at Site____12_____
Number of Wells to be monitored _____
Number of Wells to be monitored/sampled _12__
Well Casing Diameter (inches) ___2”____
Average Depth to Groundwater (ft) 5’
Average Depth of Wells (ft)___14’

Monitoring/Sampling Interval

Estimated Start Date: 8/20
Quarterly (# of events_____)
Semi-annual (# of events_____)
X Annual (# of events___2_____)
Other (please specify) _____

Well Purging Method

Hand bailing
Peristalic Pump
x Submersible Pump
ρ Micropurge
ρ No Purge
ρ Other (please specify) _____

Other Services

ρ Free Product Recovery
ρ Groundwater Well Survey
ρ Wellhead retrofit/reconstruction
ρ Other (please specify) _____

Environmental Resources, LLC

P.O. Box 5305, Bozeman, Montana 59717 Phone (406) 582-8491

GROUNDWATER MONITORING AND SAMPLING UNIT COST WORKSHEET

Task	Unit Cost	Number of Units	Total Cost
Project Management	$134.50/hr	3	$403.50
Mobilization/Demobilization[1]			
Mobilization/Demobilization	$2.69/mile	1440	$3873.60
Field Work			
Water Level Measurements [2] (unsampled wells only)	/well		$
Well Monitoring/Purging/Sampling[3]	$186.00/well	24	$4464.00
Other Service (please specify) _____			$
Other Service (please specify) _____			$
Report Preparation[4]			
Quarterly/Semi-annual	$/report		$
Annual AR-01	$/report		$
Other (please specify) _	/report		$
		Subtotal Project Expense	$8741.10

The costs below are estimates, not bids. Lodging and laboratory analysis will be paid at actual cost when documented by receipts/invoices.

Per Diem(specify number of individuals__1___)			
Per Diem: Motel	$120/person per day	4	$480.00
Per Diem: Food	$30.50/person per day	6	$183.00
Laboratory Analysis[5]			
Volatile Petroleum Hydrocarbons (VPH)	$135/sample	24	$3240.00
Extractable Petroleum Hydrocarbons (EPH) EPH "screen"	$70/sample		$
EPH "fractions"	/sample		$
BTEX/MTBE/Naphthalene only-method:	/sample		$
Polyaromatic Hydrocarbons (PAHs)	/sample		$
PTRCB sampling fee[6]	**$10**/*sample*		$
Other (please specify) _____shipping___	$15/sample	24	$360.00
Other (please specify) _IBIs_____	$150/sample	24	$3600.00
		TOTAL PROJECT EXPENSE	$16,604.10

Petroleum Tank Release Compensation Board

Soil Boring/Monitoring Well Installation Unit Cost Worksheet

Contractor Information

Company Name: Boland Drilling
Address: 4701 N Star Blvd
City, State, Zip: Great Falls, MT 59405
Cost Estimator: Chris Boland
Signature: Chris Boland

Phone: 406-761-1063
12/9/2019

Project Information and Specifications

Facility ID #
Release #
WP ID # 98-154

Glasgow, MT

Type of Drilling Equipment

Hollow-Stem Augers	x
Air Rotary	
Direct Push	
Other (please specify)	

Soil Boring

Number of Borings	3
Boring Diameter (inches)	8
Depth (per boring - ft)	14

Surface: Concrete Asphalt Barren
Soil Disposal: Onsite Stockpile Drums
Abandonment: Bentonite Soil Cuttings

Soil Sampling

Continuous Soil Sampling	
Interval Soil Sampling (specify interval)	
No Sampling	

Monitoring Well Specifications

Number of Wells	3
Surface: Concrete Asphalt Barren	
Depth (per well)	14
Estimated Depth to Groundwater (ft)	
Boring Diameter (inches)	8
Casing Diameter and type (inches)	2" pvc

Surface Completion: Flush Mount Aboveground

Cost Estimate Explanation:

(1) Mobilization/Demobilization: Includes all costs and mileage to transport equipment, materials, and personnel to and from the site location. More than one mobilization event of either the drilling rig or support vehicle will require justification and pre-approval by the DEQ-PRS and Board staffs. This item should be estimated on a per mile unit rate

(2) Soil Boring Installation: Includes all costs (labor, equipment, and materials) to drill, collect soil samples and abandon soil borings, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.

(3) Monitoring Well Installation: Includes all costs (labor, equipment, and materials) to drill, collect soil samples, and complete monitoring well to specifications and according to Montana Well Drillers Board rules, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.

(4) Drilling Standy: Drilling standby should be estimated on an hourly basis. Prior approval and justification for accumulating standby time is needed prior to billing.

(5) Well Development: Includes all costs (labor, equipment, and materials) to develop monitoring wells. This task should be estimated using a per well unit rate.

(6) Monitoring Well Abandonment: Includes all costs (labor, equipment, and materials) to properly abandon a well location according to the Montana Well Drillers Board rules. Abandonment costs should be estimated using a per well unit rate.

Soil Boring/Monitoring Well Installation Unit Cost Worksheet

TASK		UNIT COST		NUMBER OF UNITS	TOTAL COST
Mobilization/Demobilization (1)					
Mobilization/Demobilization: Drilling Rig	$	2.00	/mile	550	$ 1,100.00
Mobilization/Demobilization: Support Vehicle	$	1.50	/mile	550	$ 825.00
Soil Boring Installation (2)					
Drilling (0'-50' range per boring)	$	36.00	/foot	42	$ 1,512.00
Drilling (50'-100' range per boring)			/foot		$ -
Other (please specify) _____					$ -
Monitoring Well Installation (3)					
Drilling (0'-50' range per well)	$	36.00	/foot	42	$ 1,512.00
Drilling (50'-100' range per well)			/foot		$ -
Other (please specify) _____					$ -
Drilling Standby (4)					
-prior approval needed	$	125.00	/hour		$ -
Well Development (5)					
Well Development	$	150.00	/hour		$ -
Monitoring Well Abandonment (6)					
Abandonment	$	350.00	/well		$ -
Lodging may only be paid at actual costs when documented by receipts.					
Per Diem					
Lodging: number of individuals =	2	$ 100.00	/person per day	1	$ 200.00
Food: number of individuals =	2	$ 30.50	/person per day	2	$ 122.00
(Breakfast 5.00, Lunch 6.00, Dinner 12.00)					
			TOTAL PROJECT EXPENSE		**$ 5,271.00**

D.O.T. Drums $95.00

Additional Conditions/Comments/Costs:

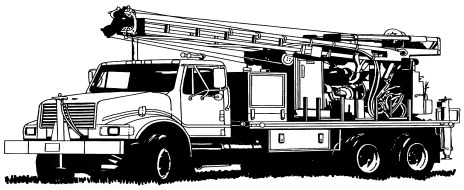
Drill 3 soil borings to 14' and construct monitor wells at Glasgow. Project # 98-154.

If you require assistance, call 406-841-5090.

Submit completed form to:

Petroleum Tank Release Compensation Board PO Box 200902, Helena MT 59620-0902

HAZ TECH Drilling, Inc.



P.O. Box 30622
2910 Hannon Road, Suite #6
Billings, MT 59107
Phone: 406-896-1164 or 800-359-1502
Fax: 406-896-1462

Proposal

TO: Environmental Resource Management, Inc.
ATTN: Bob Waller
P.O. Box 5305
Bozeman, MT 59717
Ph-406-582-8491-Cell

DATE: 12/6/2019

PROJECT Project 98-154
Glasgow, MT

Description:
3-2" wells to 14' with 10' of .020 screen and flush mount covers. Cuttings disposed on site.

TERMS: Net 30 Days

	UNITS EST.	UNIT PRICE	AMOUNT EST.
**********	**********	**********	**********
Mob/ Demob, Per Mile	580	$3.25	$1,885.00
Support Truck, Per Day	3	$150.00	$450.00
Perdiem, Per Crew Day	3	$61.00	$183.00
Lodging, Per Night, Estimated	2	$250.00	$500.00
Auger Drilling, Per Ft	42	$20.00	$840.00
2" Well Installation, Per Ft	42	$29.50	$1,239.00
8" X 12" Flush Mount Vaults, Each	3	$100.00	$300.00
			**********
		ESTIMATED TOTAL:	$5,397.00

Notes:
1) Client is responsible to clear location of utilities.
2) Client is responsible for disposal of drill cuttings.
3) Client will be invoiced only the amounts used.
4) We assume that site is accessible by truck mount drill rig.

Proposal By: Paul Bray